

**ACTIVITY 30
FARMING OPERATIONS
LIVESTOCK HUSBANDRY**

EMISSION INVENTORY CODES (CES CODES) AND DESCRIPTION:

620-618-0262-0101	(89516)	Livestock Husbandry – Dairy Cattle
620-618-0262-0102	(89524)	Livestock Husbandry – Range Cattle
620-618-0262-0103	(89532)	Livestock Husbandry – Feedlot Cattle
620-618-0262-0104	(89540)	Livestock Husbandry – Broilers (Chicken)
620-618-0262-0105	(89557)	Livestock Husbandry – Layers (Chicken)
620-618-0262-0106	(89565)	Livestock Husbandry – Turkeys
620-618-0262-0107	(89573)	Livestock Husbandry – Swine
620-618-0262-0108	(89581)	Livestock Husbandry – Sheep
620-618-0262-0109	(89599)	Livestock Husbandry – Horses
620-618-0262-0110	(89722)	Livestock Husbandry – Other (Goats)

DESCRIPTION:

This activity is used to estimate the total organic compounds (TOC), reactive organic compound (ROC) and ammonia (NH₃) emissions produced by cattle, poultry, swine, sheep, horses, and goats.

TOTAL ACTIVITY EMISSIONS:

	<u>TOC</u>	<u>ROC</u>	<u>NH₃</u>
Planning (tons)		0.12	
Annual (tons)	543.1	43.5	47.7

TEMPORAL DISTRIBUTION

Daily:	Activity twenty-four hours a day.
Weekly:	Uniform activity seven days a week.
Annual:	Uniform activity during the year.

SPATIAL DISAGGREGATION: Population

PROCESS RATES: See Table 1

EMISSION FACTORS: See Table 1

ORGANIC REACTIVE FRACTION: 0.0800 (Organic Profile Number 203)

EMISSIONS: See Table 1

METHODOLOGY:

For cattle, chickens, turkeys, swine, sheep, and goats, year 2002 population was obtained from the Ventura County Agricultural Commissioner. The horse population was compiled by combining the 1997 Agricultural Census Data, developed by the United States Department Of Agriculture, and the California Department of Food and Agriculture (CDFA) 2001 Agricultural Resource Directory. For each category, the emissions are calculated by multiplying a per animal emission factor by the population of each animal type (references 1 and 7).

ASSUMPTIONS:

1. The emissions from composting and land application of livestock wastes are not included in the Livestock Husbandry Inventory.
2. All animals within a single class produce the same emissions (e.g., dairy cows, calves, and heifers each produce 160 lbs TOC/head/year) (Reference 1).
3. TOG emission factor for all animals includes all emission sources for each animal type including emissions directly from the animal, as well as waste handling operations (Reference 1).
4. For all livestock, 8 percent of TOC is assumed to be ROG (Reference 5).

REFERENCES:

1. California Air Resources Board; "Methods For Assessing Livestock Husbandry," Interim Draft, Table A; Revised September 2003.
2. County of Ventura, Agricultural Commissioner, September 16, 2003.
3. County of Ventura, Agricultural Commissioner, August 4, 2005.
4. United States Department of Food and Agriculture, 2001 Agriculture Resource Directory.
5. United States Department of Agriculture, 1997 Agricultural Resource Directory.
6. U.S. EPA (1980) Volatile Organic Compound (VOC) Species Data Manual, Second Edition, EPA-450/4-80-015, July 1980.
7. ENVIRION International Corporation, Final Work Plan, California Regional PM10/PM2.5 Air Quality Study Ammonia Emissions Improvement Projects in Support of CRPASQ Aerosol Modeling and Data Analyses: Draft Ammonia Inventory Development (Prepared for California Air Resources Board), Table 2-5 Livestock Emission Factors, April 13, 2001.

TABLE 1
2002 LIVESTOCK HUSBANDRY
PROCESS RATES, EMISSION FACTORS, AND EMISSIONS

EIC	Livestock	Population	TOC Emission factor Lbs/head/year	ROC Emission factor Lbs/head/year	NH3 Emission factor Lbs/head/year	Emissions TOC (tpy)	Emissions ROC (tpy)	Emissions NH3 (tpy)
620-618-0262-0101	Dairy Cattle	0	160.0	12.8	74.0	0.0	0.0	0.0
620-618-0262-0102	Range Cattle	5,000	160.0	12.8	1.54	400.0	32.0	3.8
620-618-0262-0103	Feedlot Cattle	0	160.0	12.8	74.0	0.0	0.0	0.0
620-618-0262-0104	Broiler Chicken	10,000	2.4	0.19	0.37	12.0	1.0	1.8
620-618-0262-0105	Layers Chicken	0	2.4	0.19	1.00	0.0	0.0	0.0
620-618-0262-0106	Turkeys	0	2.4	0.19	0.37	0.0	0.0	0.0
620-618-0262-0107	Swine	0	58.0	4.6	20.3	0.0	0.0	0.0
620-618-0262-0108	Sheep	357	12.0	0.96	7.43	2.1	0.2	1.3
620-618-0262-0109	Horses	3008	83.8	6.7	26.9	126.0	10.1	40.5
620-618-0262-0110	Goats	500	12.0	0.96	1.28	3.0	0.2	0.3
TOTAL						543.1	43.5	47.7